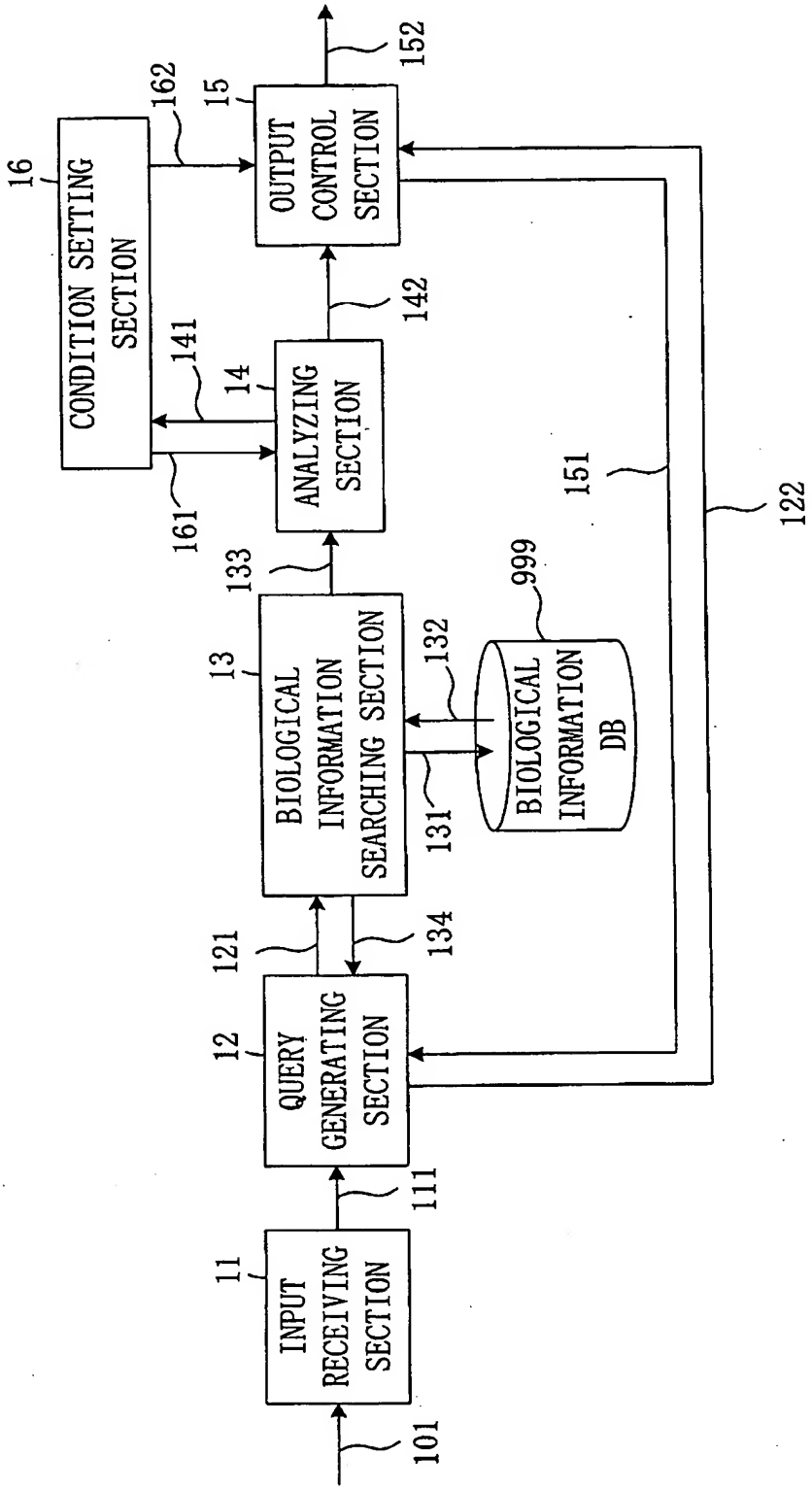
INPUT RECEIVING SECTION
11
101
111
QUERY GENERATING SECTION
12
121
134
BIOLOGICAL INFORMATION SEARCHING SECTION
13
131
132
133
BIOLOGICAL INFORMATION DB
999
ANALYZING SECTION
14
141
142
CONDITION SETTING SECTION
16
161
162
OUTPUT CONTROL SECTION
15
151
152
122

FIG. 1

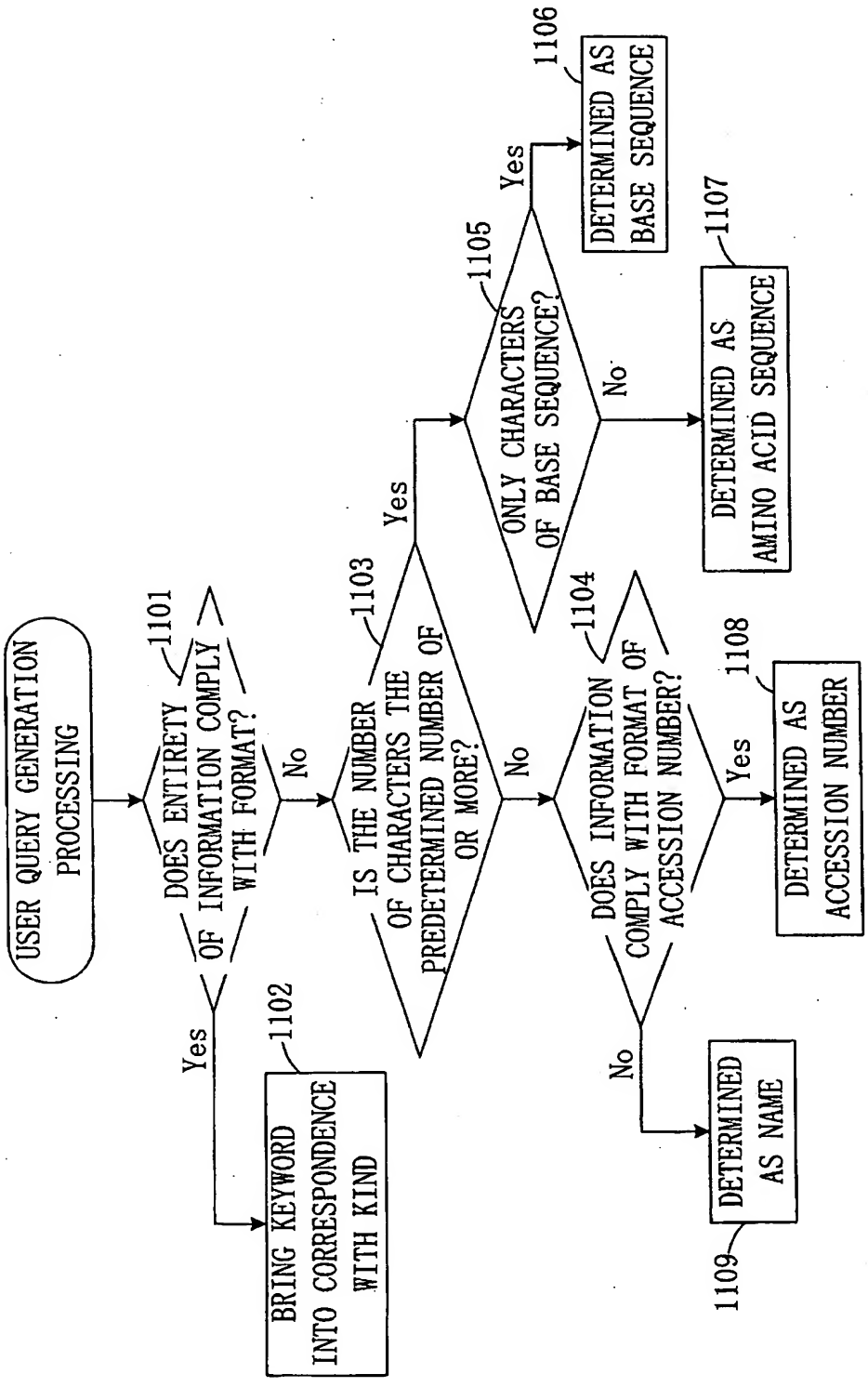
USER QUERY GENERATION PROCESSING
1101
DOES ENTIRETY OF INFORMATION COMPLY WITH FORMAT?
Yes
No
1102
BRING KEYWORD INTO CORRESPONDENCE WITH KIND
1103
IS THE NUMBER OF CHARACTERS THE PREDETERMINED NUMBER OF OR MORE?
Yes
No
1105
ONLY CHARACTERS OF BASE SEQUENCE?
Yes
No
1106
DETERMINED AS BASE SEQUENCE
1107
DETERMINED AS AMINO ACID SEQUENCE
1104
DOES INFORMATION COMPLY WITH FORMAT OF ACCESSION NUMBER?
Yes
No
1108
DETERMINED AS ACCESSION NUMBER
1109
DETERMINED AS NAME

FIG. 2

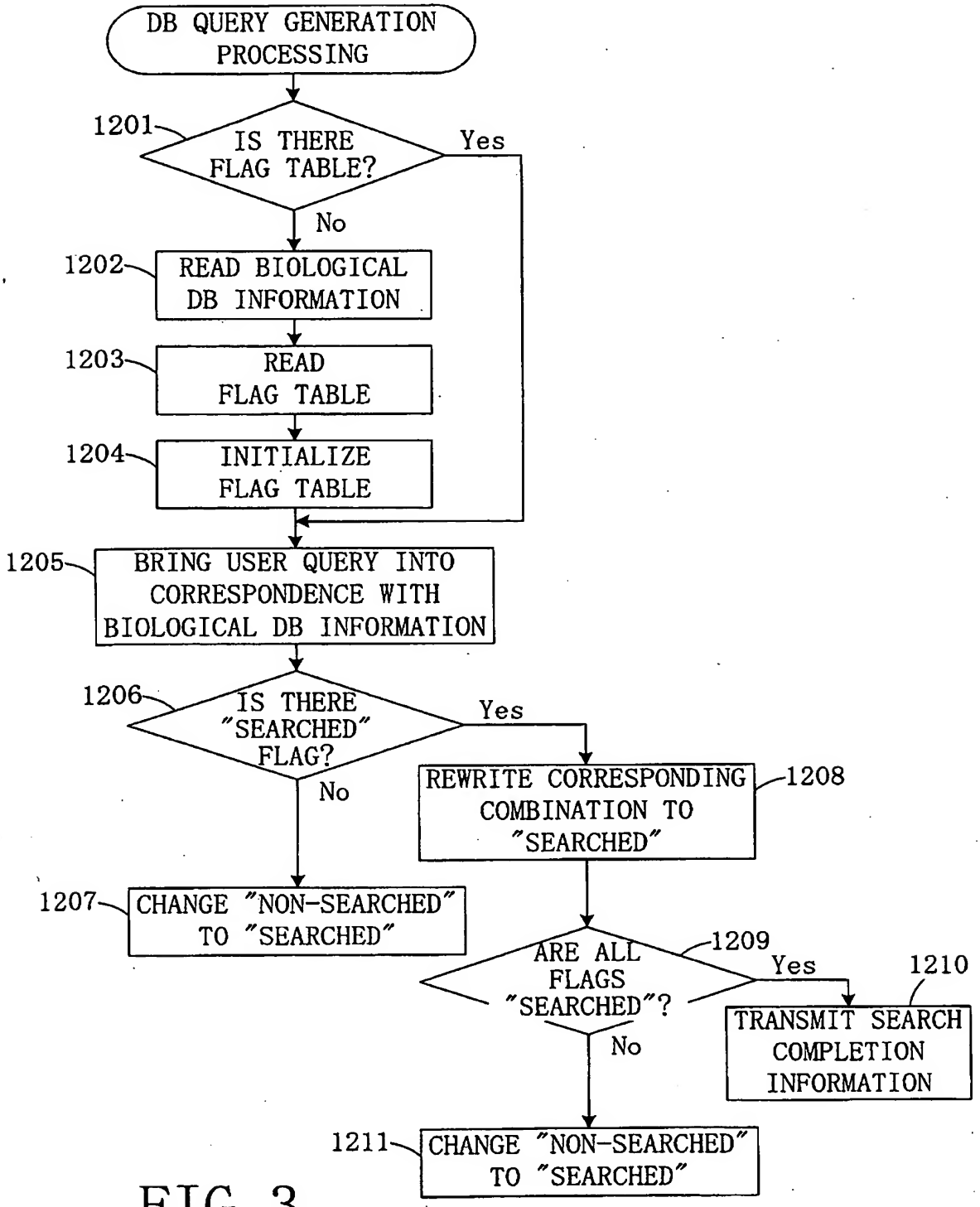
DB QUERY GENERATION PROCESSING
1201
IS THERE FLAG TABLE?
Yes
No
1202
READ BIOLOGICAL DB INFORMATION
1203
READ FLAG TABLE
1204
INITIALIZE FLAG TABLE
1205
BRING USER QUERY INTO CORRESPONDENCE WITH BIOLOGICAL DB INFORMATION
1206
IS THERE "SEARCHED" FLAG?
Yes
No
REWRITE CORRESPONDING COMBINATION TO "SEARCHED"
1208
1207
CHANGE "NON-SEARCHED" TO "SEARCHED"
ARE ALL FLAGS "SEARCHED"?
1209
Yes
1210
TRANSMIT SEARCH COMPLETION INFORMATION
No
1211
CHANGE "NON-SEARCHED" TO "SEARCHED"

FIG. 3

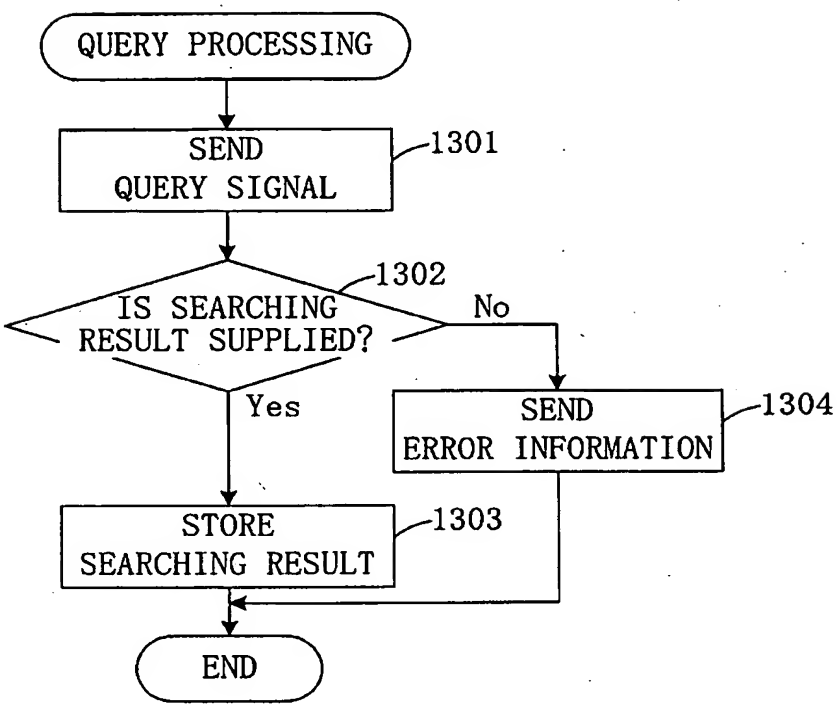
QUERY PROCESSING
SEND
QUERY SIGNAL
1301
IS SEARCHING
RESULT SUPPLIED?
1302
No
Yes
SEND
ERROR INFORMATION
1304
STORE
SEARCHING RESULT
1303
END

FIG. 4

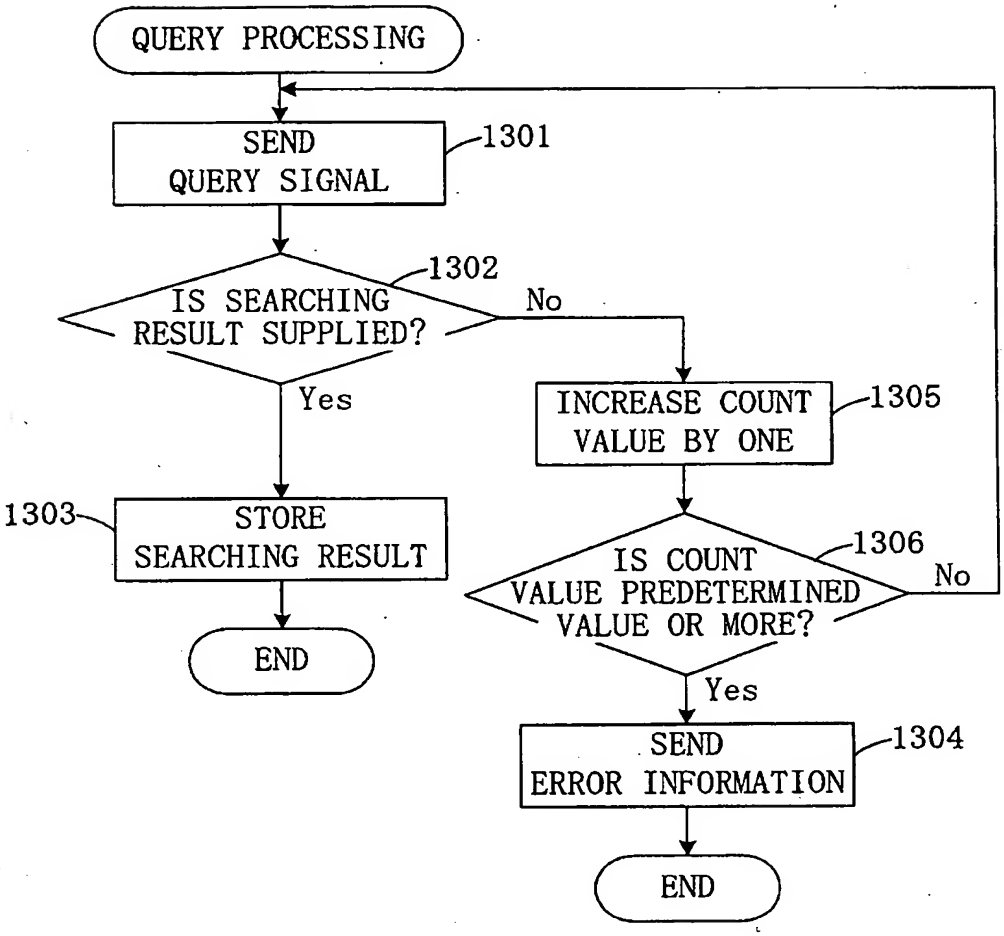
QUERY PROCESSING
SEND QUERY SIGNAL
1301
IS SEARCHING RESULT SUPPLIED?
1302
No
Yes
INCREASE COUNT VALUE BY ONE
1305
1303
STORE SEARCHING RESULT
IS COUNT VALUE PREDETERMINED VALUE OR MORE?
1306
No
END
Yes
SEND ERROR INFORMATION
1304
END

FIG. 5

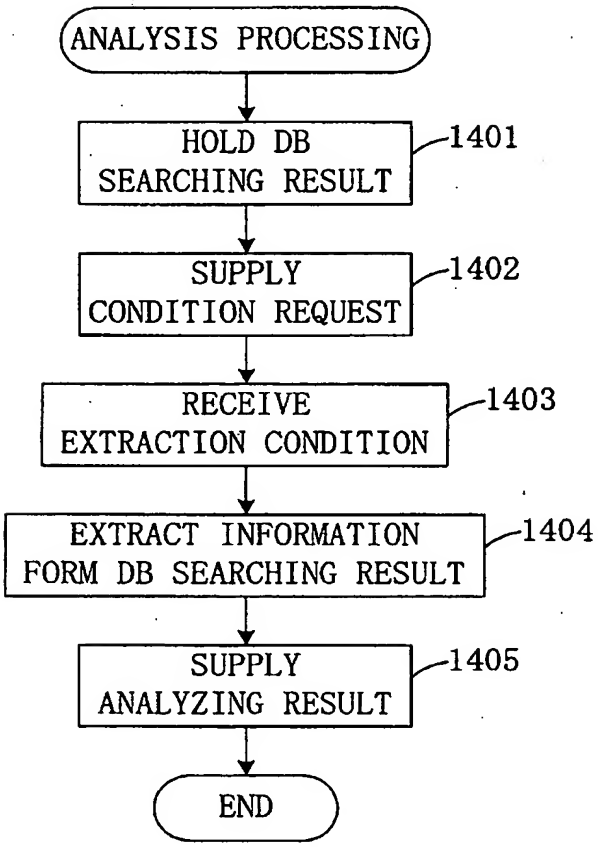
ANALYSIS PROCESSING
HOLD DB SEARCHING RESULT
1401
SUPPLY CONDITION REQUEST
1402
RECEIVE EXTRACTION CONDITION
1403
EXTRACT INFORMATION FORM DB SEARCHING RESULT
1404
SUPPLY ANALYZING RESULT
1405
END

FIG. 6

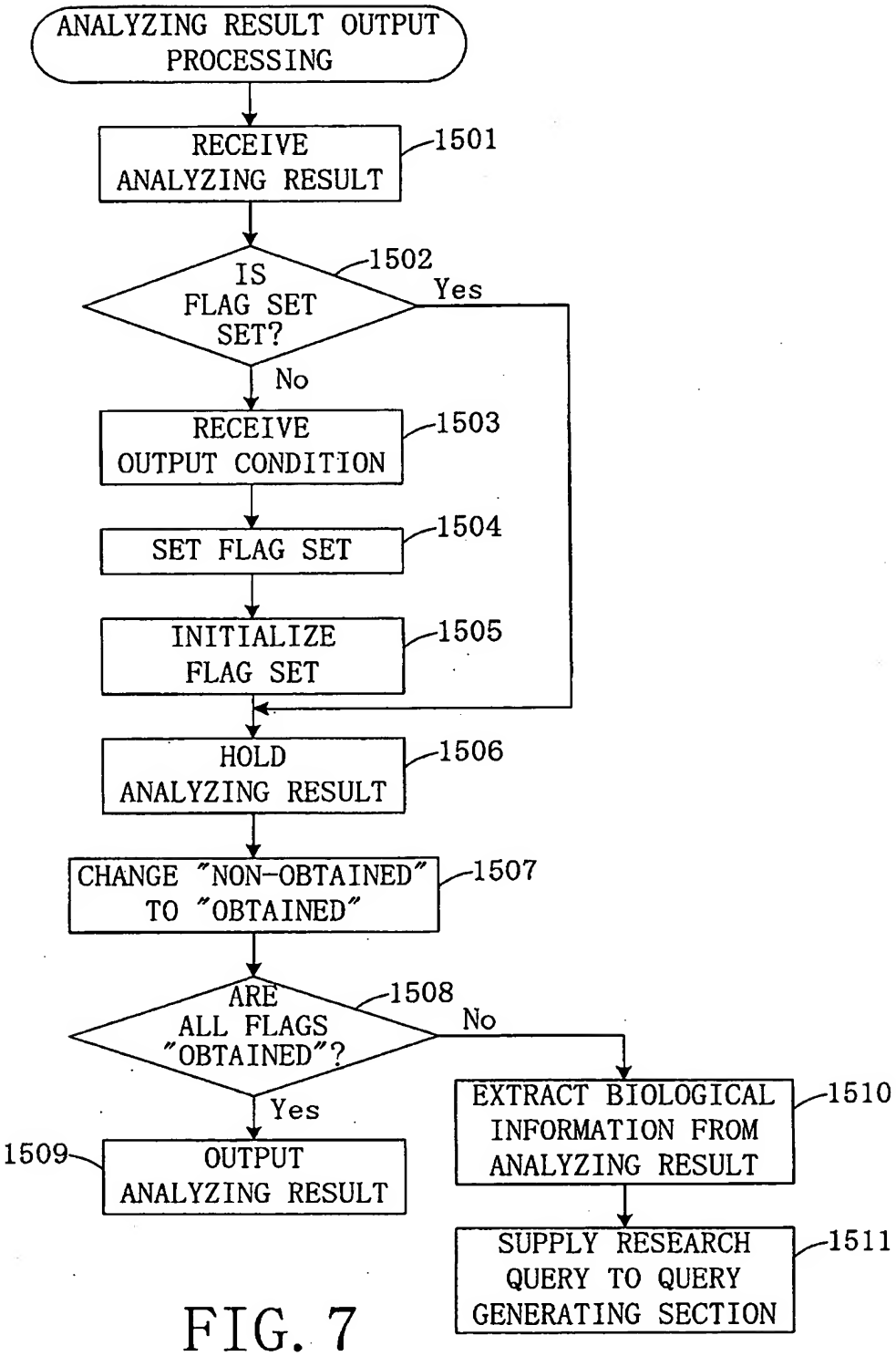
ANALYZING RESULT OUTPUT PROCESSING
RECEIVE ANALYZING RESULT
1501
IS FLAG SET SET?
1502
Yes
No
RECEIVE OUTPUT CONDITION
1503
SET FLAG SET
1504
INITIALIZE FLAG SET
1505
HOLD ANALYZING RESULT
1506
CHANGE "NON-OBTAINED" TO "OBTAINED"
1507
ARE ALL FLAGS "OBTAINED"?
1508
No
Yes
OUTPUT ANALYZING RESULT
1509
EXTRACT BIOLOGICAL INFORMATION FROM ANALYZING RESULT
1510
SUPPLY RESEARCH QUERY TO QUERY GENERATING SECTION
1511

FIG. 7

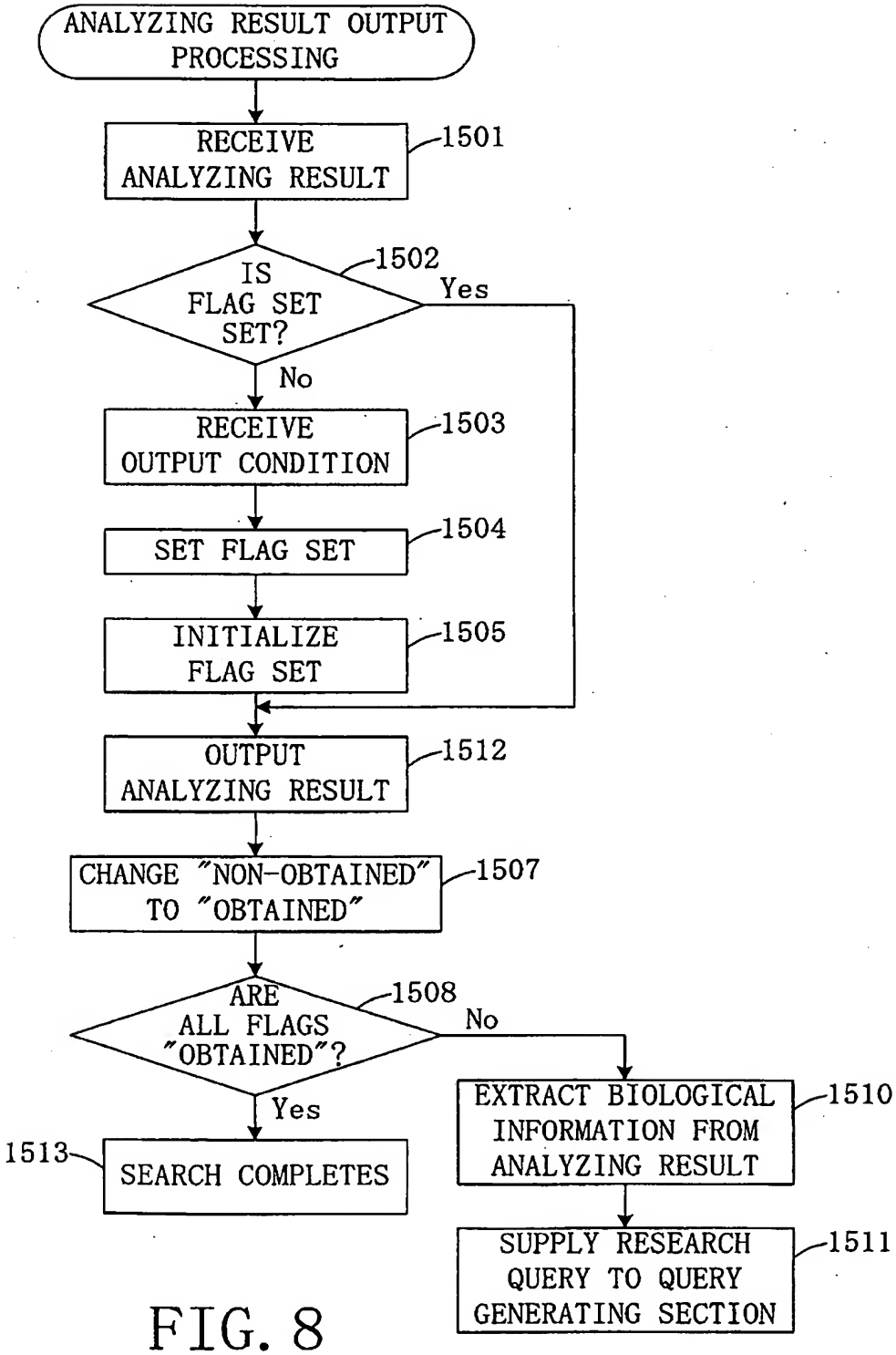
ANALYZING RESULT OUTPUT PROCESSING
RECEIVE ANALYZING RESULT
1501
IS FLAG SET SET?
1502
Yes
No
RECEIVE OUTPUT CONDITION
1503
SET FLAG SET
1504
INITIALIZE FLAG SET
1505
OUTPUT ANALYZING RESULT
1512
CHANGE "NON-OBTAINED" TO "OBTAINED"
1507
ARE ALL FLAGS "OBTAINED"?
1508
No
Yes
EXTRACT BIOLOGICAL INFORMATION FROM ANALYZING RESULT
1510
SUPPLY RESEARCH QUERY TO QUERY GENERATING SECTION
1511
1513
SEARCH COMPLETES

FIG. 8

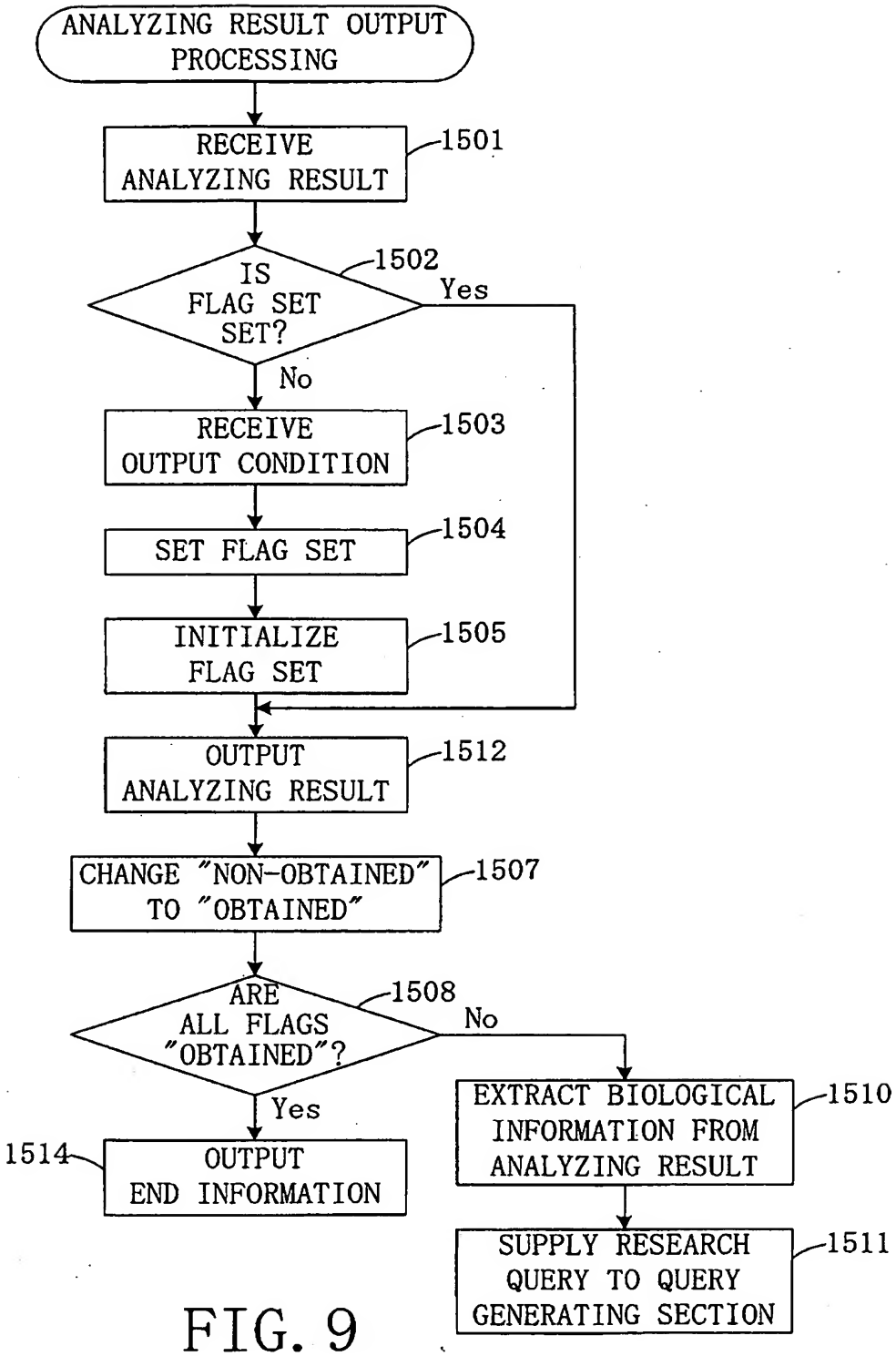
ANALYZING RESULT OUTPUT PROCESSING
RECEIVE ANALYZING RESULT
1501
IS FLAG SET SET?
1502
Yes
No
RECEIVE OUTPUT CONDITION
1503
SET FLAG SET
1504
INITIALIZE FLAG SET
1505
OUTPUT ANALYZING RESULT
1512
CHANGE "NON-OBTAINED" TO "OBTAINED"
1507
ARE ALL FLAGS "OBTAINED"?
1508
No
Yes
EXTRACT BIOLOGICAL INFORMATION FROM ANALYZING RESULT
1510
SUPPLY RESEARCH QUERY TO QUERY GENERATING SECTION
1511
1514
OUTPUT END INFORMATION

FIG. 9

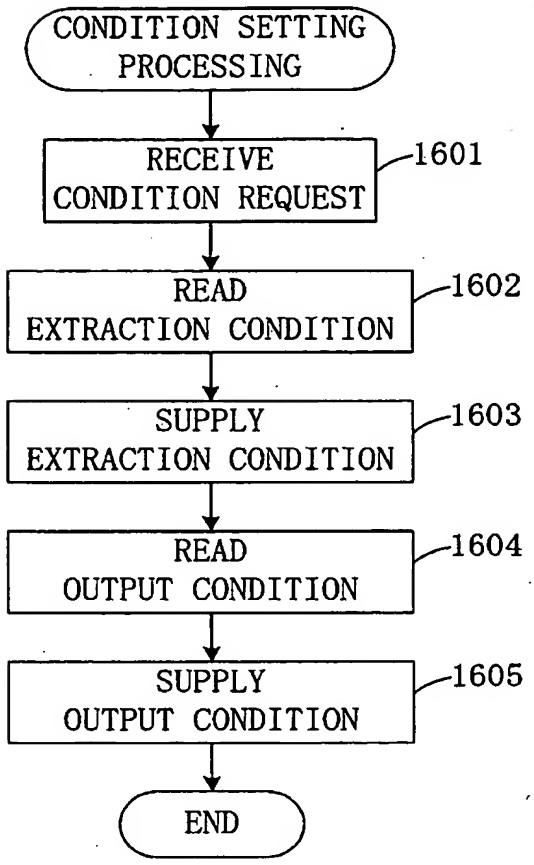
CONDITION SETTING PROCESSING
RECEIVE CONDITION REQUEST
1601
READ EXTRACTION CONDITION
1602
SUPPLY EXTRACTION CONDITION
1603
READ OUTPUT CONDITION
1604
SUPPLY OUTPUT CONDITION
1605
END

FIG. 10

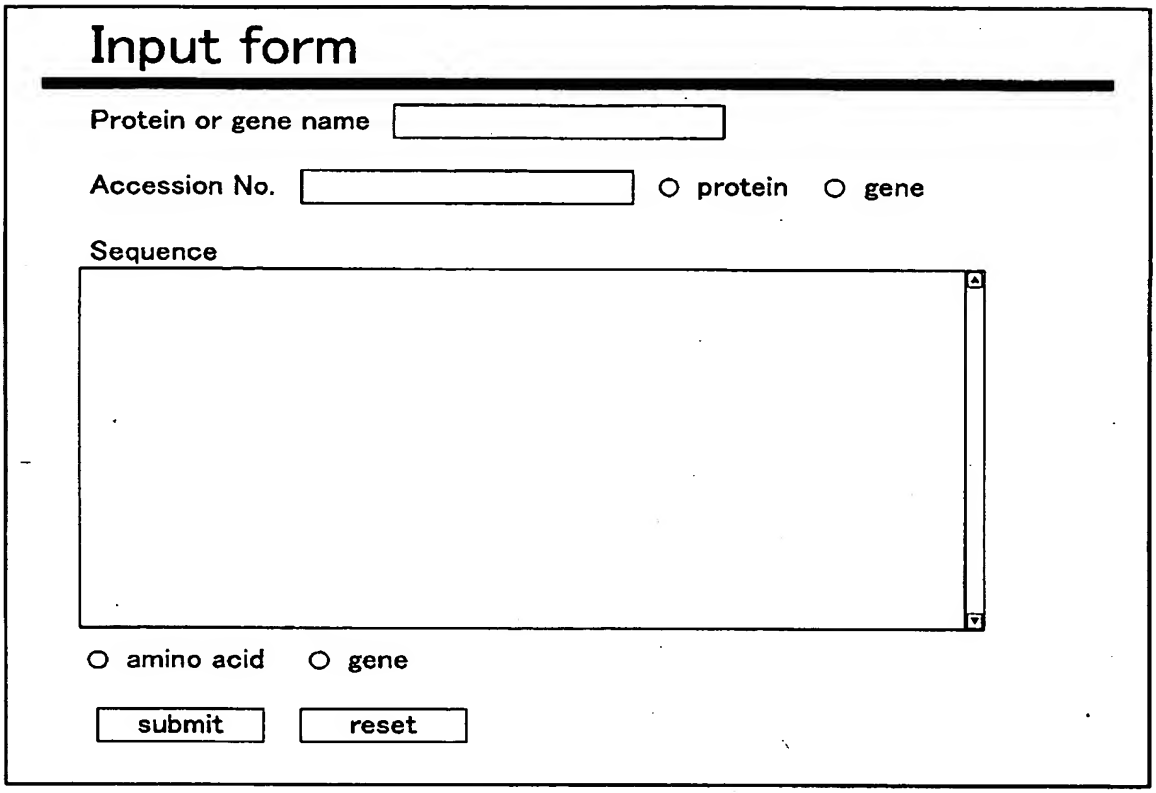
Input form
Protein or gene name
Accession No.
protein
gene
Sequence
amino acid
gene
submit
reset

FIG. 11

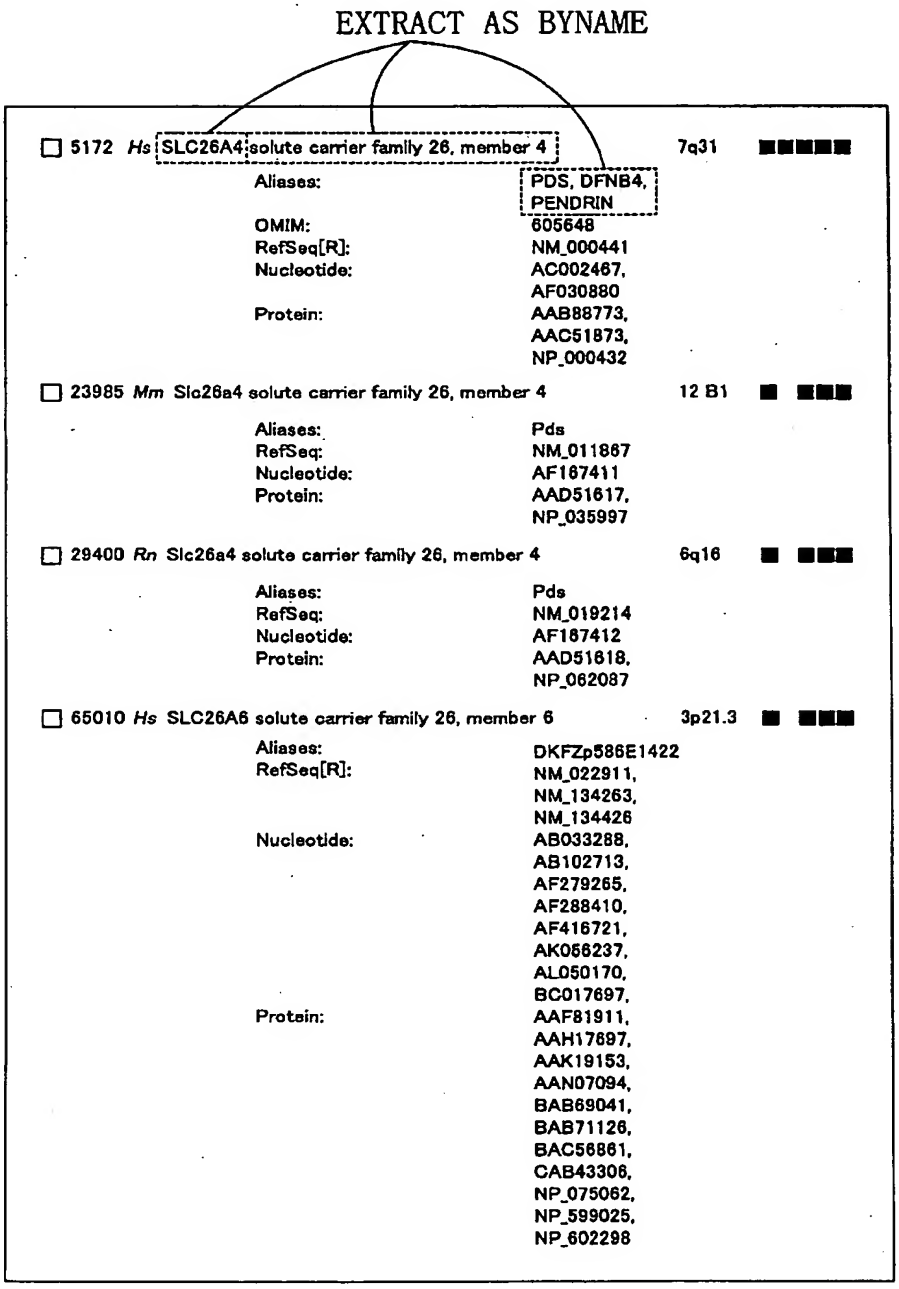
EXTRACT AS BYNAME
5172 Hs SLC26A4 solute carrier family 26, member 4
7q31
Aliases:
PDS, DFNB4, PENDRIN
OMIM:
605648
RefSeq[R]:
NM_000441
Nucleotide:
AC002467, AF030880
Protein:
AAB88773, AAC51873, NP_000432
23985 Mm Slc26a4 solute carrier family 26, member 4
12 B1
Aliases:
Pds
RefSeq:
NM_011867
Nucleotide:
AF167411
Protein:
AAD51617, NP_035997
29400 Rn Slc26a4 solute carrier family 26, member 4
6q16
Aliases:
Pds
RefSeq:
NM_019214
Nucleotide:
AF167412
Protein:
AAD51618, NP_062087
65010 Hs SLC26A6 solute carrier family 26, member 6
3p21.3
Aliases:
DKFZp586E1422
RefSeq[R]:
NM_022911, NM_134263, NM_134426
Nucleotide:
AB033288, AB102713, AF279265, AF288410, AF416721, AK056237, AL050170, BC017697,
Protein:
AAF81911, AAH17697, AAK19153, AAN07094, BAB69041, BAB71126, BAC56861, CAB43306, NP_075062, NP_599025, NP_602298

FIG. 12

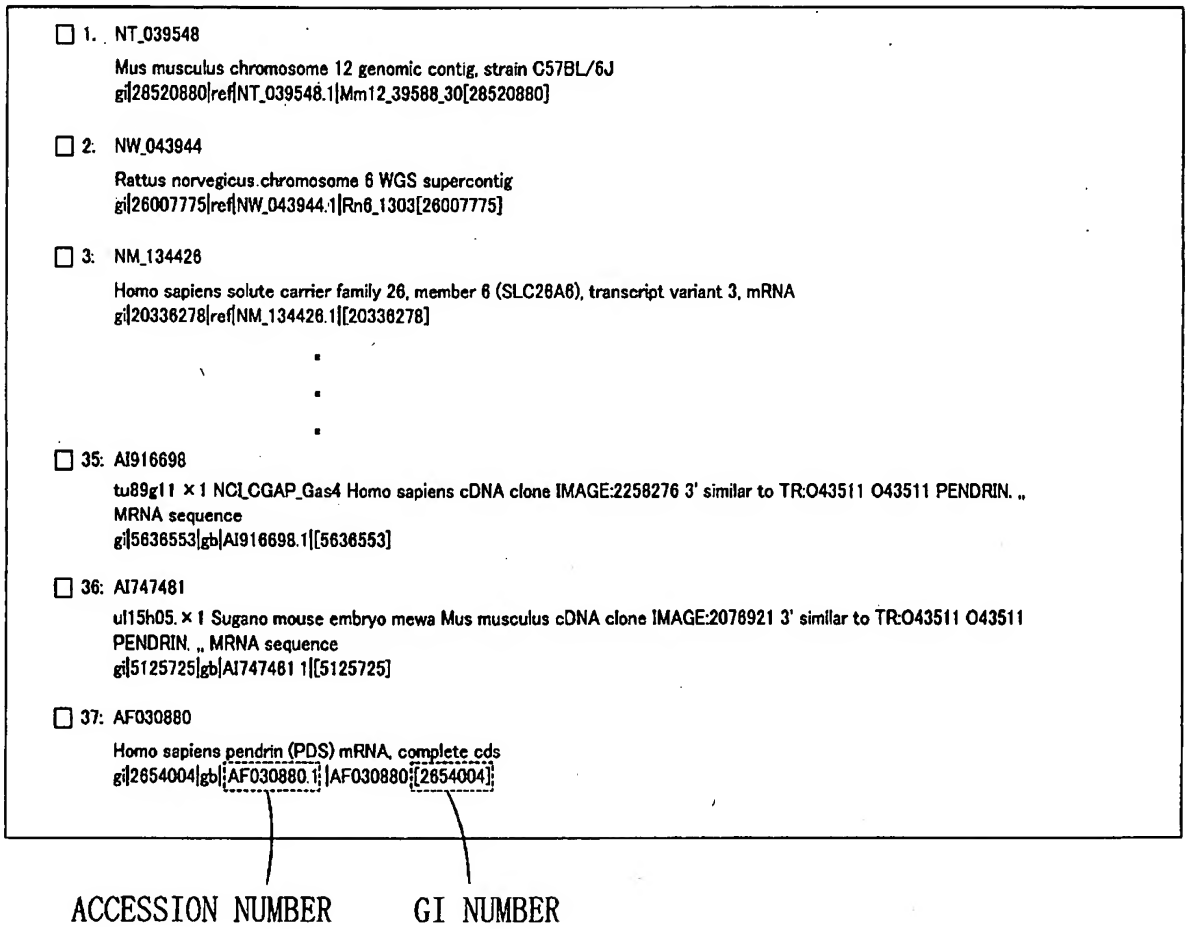

FIG. 13

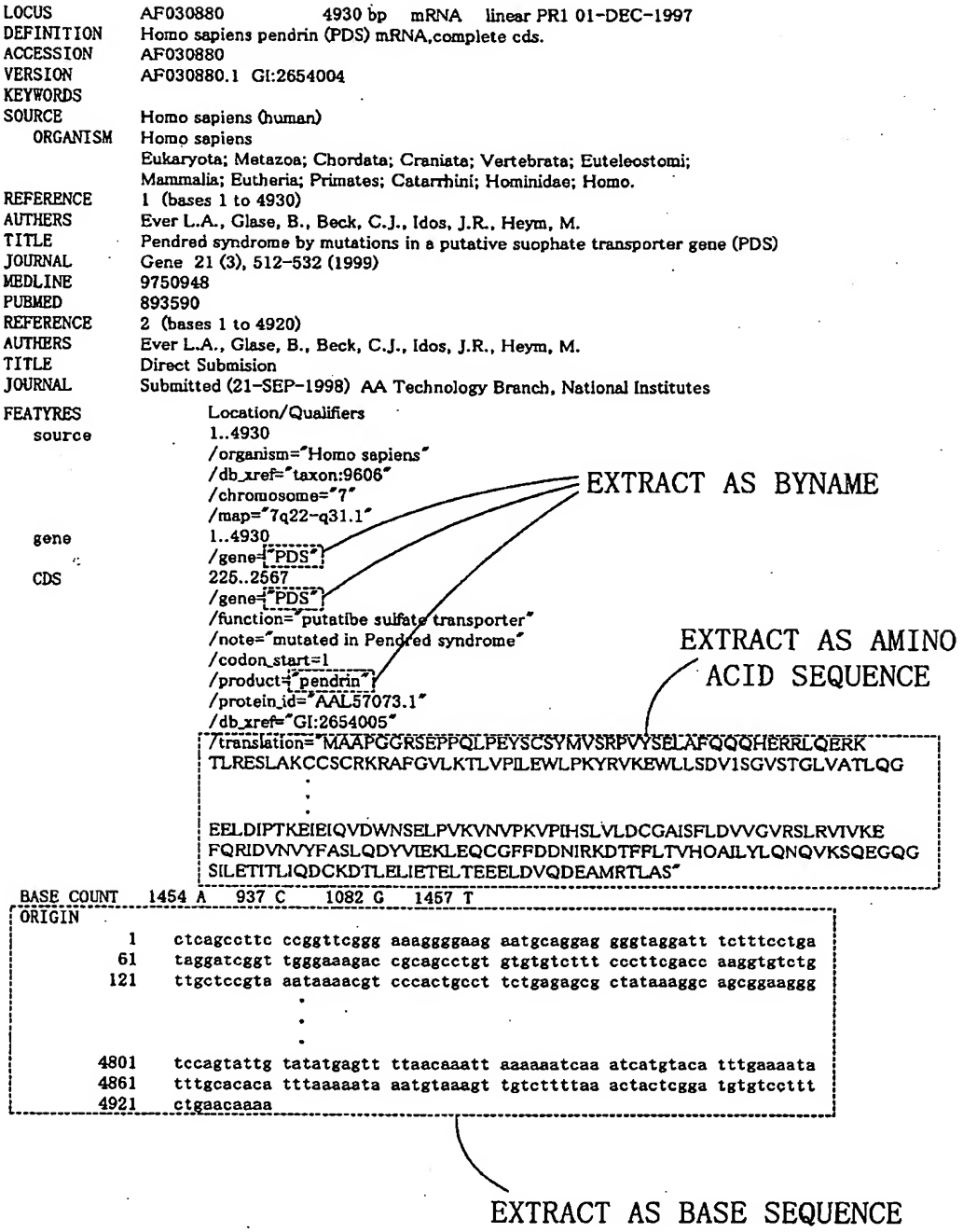
LOCUS AF030880 4930 bp mRNA linear PRI 01-DEC-1997
DEFINITION Homo sapiens pendrin (PDS) mRNA,complete cds.
ACCESSION AF030880
VERSION AF030880.1 GI:2654004
KEYWORDS
SOURCE Homo sapiens (human)
ORGANISM Homo sapiens
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
REFERENCE 1 (bases 1 to 4930)
AUTHERS Ever L.A., Glase, B., Beck, C.J., Idos, J.R., Heym, M.
TITLE Pendred syndrome by mutations in a putative suophate transporter gene (PDS)
JOURNAL Gene 21 (3), 512-532 (1999)
MEDLINE 9750948
PUBMED 893590
REFERENCE 2 (bases 1 to 4920)
AUTHERS Ever L.A., Glase, B., Beck, C.J., Idos, J.R., Heym, M.
TITLE Direct Submision
JOURNAL Submitted (21-SEP-1998) AA Technology Branch, National Institutes
FEATYRES Location/Qualifiers
source 1..4930
/organism="Homo sapiens"
/db_xref="taxon:9606"
/chromosome="7"
/map="7q22-q31.1"
gene 1..4930
/gene="PDS"
CDS 225..2567
/gene="PDS"
/function="putatibe sulfate transporter"
/note="mutated in Pendred syndrome"
/codon_start=1
/product="pendrin"
/protein_id="AAL57073.1"
/db_xref="GI:2654005"
/translation="MAAPGGRSEPPQLPEYSCSYMVSRPVYSELAFQQQHERRLQERK
TLRESLAKCCSCRKRAFGVLKTLVPILEWLPKYRVKEWLLSDV1SGVSTGLVATLQG
EELDIPTKEIEIQVDWNSELPVKVNVPKVPIHSLVLDCGAISFLDVVGVRSLRVIVKE
FQRIDVNVYFASLQDYVIEKLEQCGFFDDNIRKDTFFLTVHOAILYLQNQVKSQEGQG
SILETITLIQDCKDTLELIETELTEEELDVQDEAMRTLAS"
EXTRACT AS BYNAME
EXTRACT AS AMINO ACID SEQUENCE
BASE COUNT 1454 A 937 C 1082 G 1457 T
ORIGIN
1 ctcagccttc ccggttcggg aaaggggaag aatgcaggag gggtaggatt tctttcctga
61 taggatcggt tgggaaagac cgcagcctgt gtgtgtcttt cccttcgacc aaggtgtctg
121 ttgctccgta aataaaacgt cccactgcct tctgagagcg ctataaaggc agcggaaggg
4801 tccagtattg tatatgagtt ttaacaaatt aaaaaatcaa atcatgtaca tttgaaaata
4861 tttgcacaca tttaaaaata aatgtaaagt tgtcttttaa actactcgga tgtgtccttt
4921 ctgaacaaaa
EXTRACT AS BASE SEQUENCE

FIG. 14

```
BLASTP 2.2.3 [Apr-12-2000]
                                                                  Score  E
Sequences producing significant alignments:                       (bits) Value

ref|NP_000432.1| pendrin [Homo sapiens] >gi|11421915|ref|XP_0049...  1229  0.0
ref|NP_062087.1| pendrin: Pendred syndrome homolog (human) [Ratt...  1101  0.0
ref|NP_035997.1| pendrin: Pandred's syndrome [mus musculus] > gi| ...  1098  0.0
...

pir||B82127 sulfate permease family protein VC2031 [imported]...     35  2.8
emb|CAB62519.1| (AL050358) hypothetical protein [Homo sapiens]       34  3.6
pir||T16522 hypothetical pritein K02E10.2 - Caenorhabditis alega...  34  4.7

>ref|NP_000432.1| pendrin [Homo sapiens]                  EXTRACT AS NAME
 ref|XP_004953.1| pendrin [Homo sapiens]
 sp|043511|PEND_HUMAN PENDRIN (SODIUM-INDEPENDENT CHLORIDE/IODIDE TRANSPORTER)
 gb|AA51873.1| (AF030880) pendrin [Homo sapiens]
          Length = 780

Score = 1229 bits (3180), Expect = 0.0
Identities = 649/780 (83%), Positives = 649/780 (83%)

Query: 1   MAAPGGRSEPPQLPEYSCSYMVSRPVYSELAFQQQMERRLQERKTLRESLAKCCSCSRKR 60
            MAAPGGRSEPPQLPEYSCSYMVSRPVYSELAFQQQHERRLQERKTLRESLAKCCSCSRKR
Sbjct: 1   MAAPGGRSEPPQLPEYSCSYMVSRPVYSELAFQQQHERRLQERKTLRESLAKCCSCSRKR 60

...

Query: 721 TVHDAILYLQNQVKSQEGQGSILETITLIQDCKDXXXXXXXXXXXXXXXDVQDEAMRTLAS 780
            TVHDAILYLQNQVKSQEGGGSILETITLIQDCKD               DVQDEAMRTLAS
Sbjct: 721 TVHDAILYLQNQVKSQEGQGSILETITLIQDCKDTLELIETELTEEELDVQDVEAMRTLAS 780
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FIG. 15

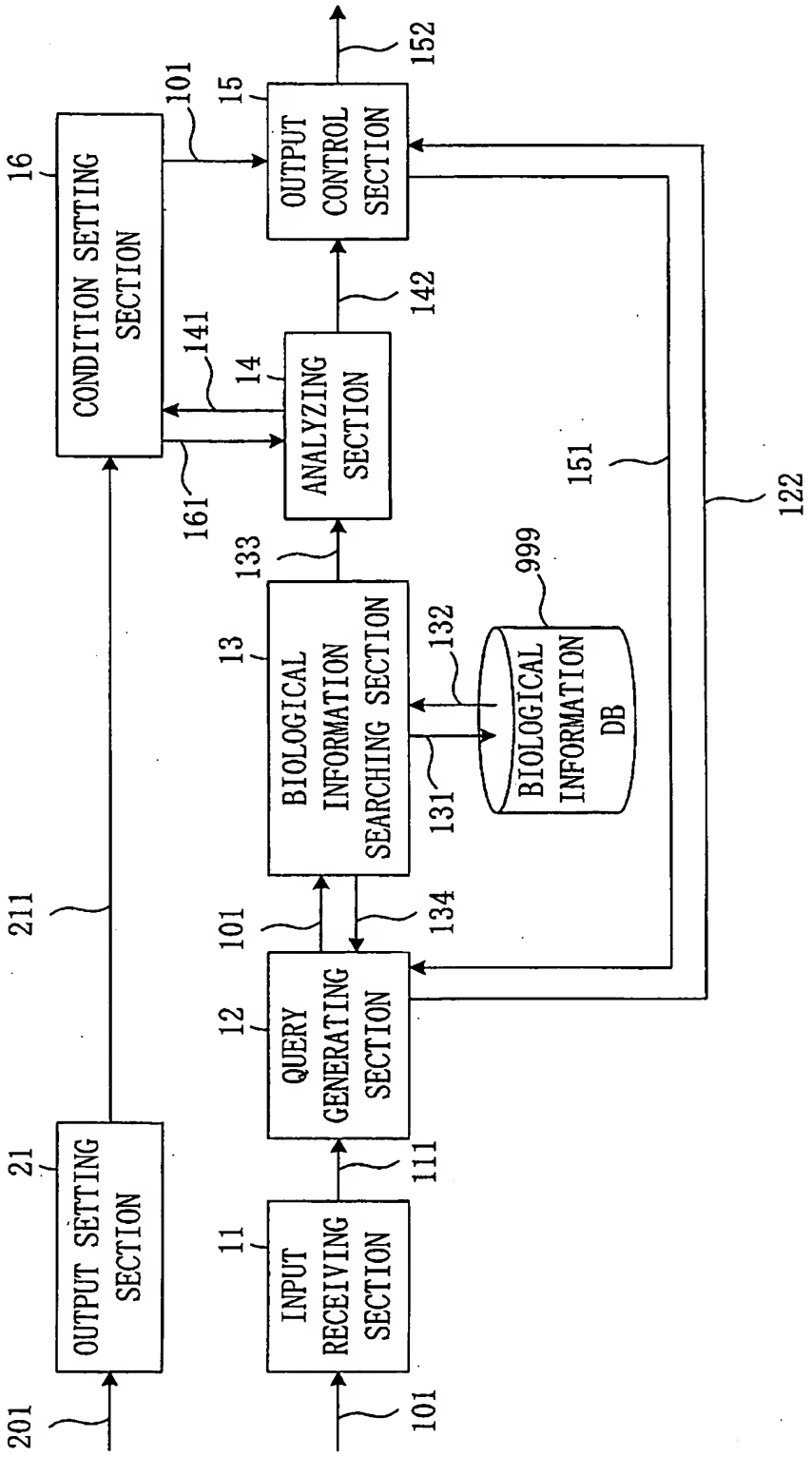

OUTPUT SETTING SECTION
21
201
INPUT RECEIVING SECTION
11
101
111
QUERY GENERATING SECTION
12
211
101
134
BIOLOGICAL INFORMATION SEARCHING SECTION
13
133
132
131
BIOLOGICAL INFORMATION DB
999
ANALYZING SECTION
14
141
142
161
CONDITION SETTING SECTION
16
101
OUTPUT CONTROL SECTION
15
152
151
122

FIG. 16

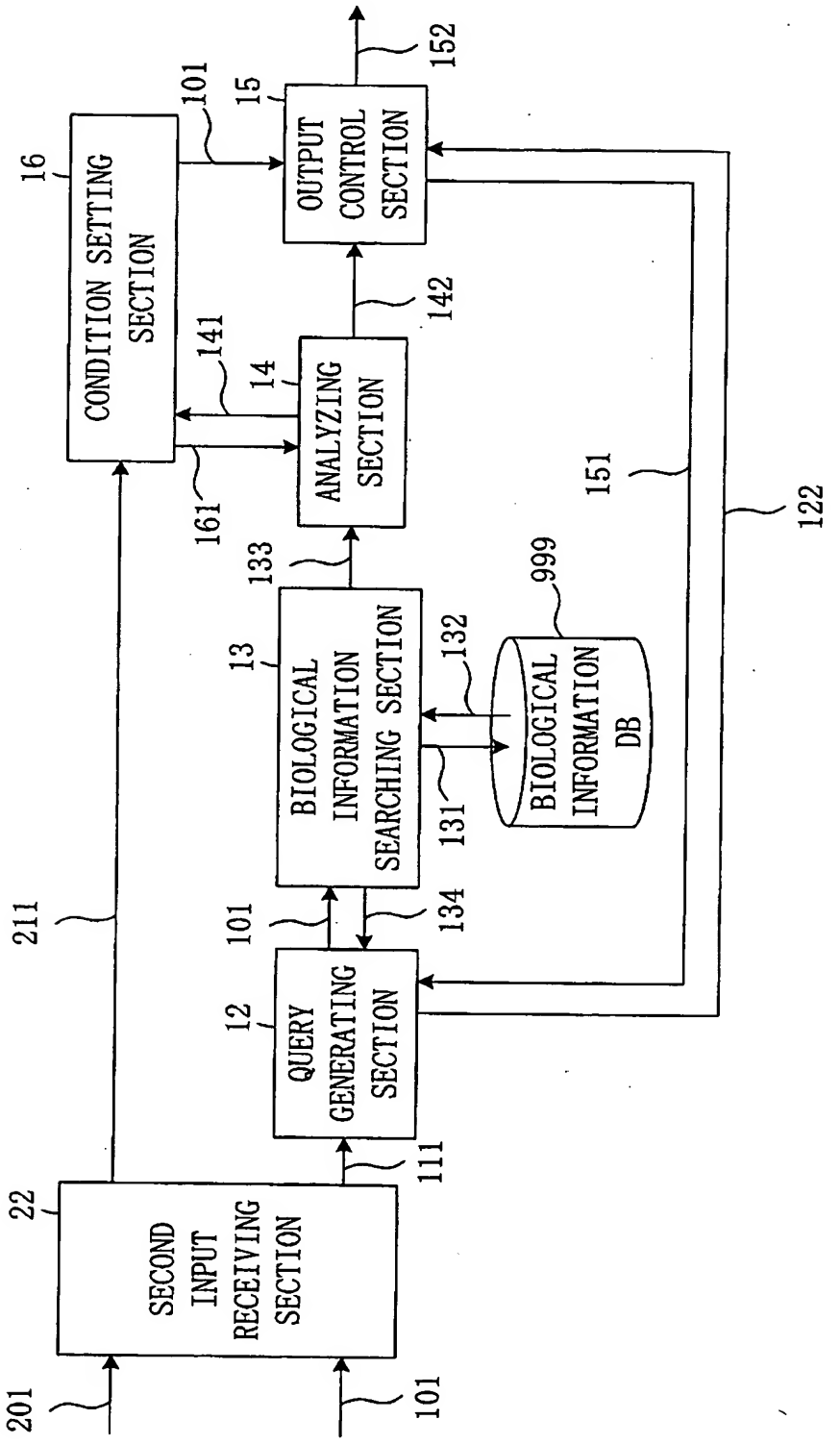

SECOND INPUT RECEIVING SECTION
QUERY GENERATING SECTION
BIOLOGICAL INFORMATION SEARCHING SECTION
BIOLOGICAL INFORMATION DB
ANALYZING SECTION
CONDITION SETTING SECTION
OUTPUT CONTROL SECTION
201
22
211
12
101
13
131
132
133
134
999
14
141
142
161
16
15
101
152
151
122
111
101

FIG. 17

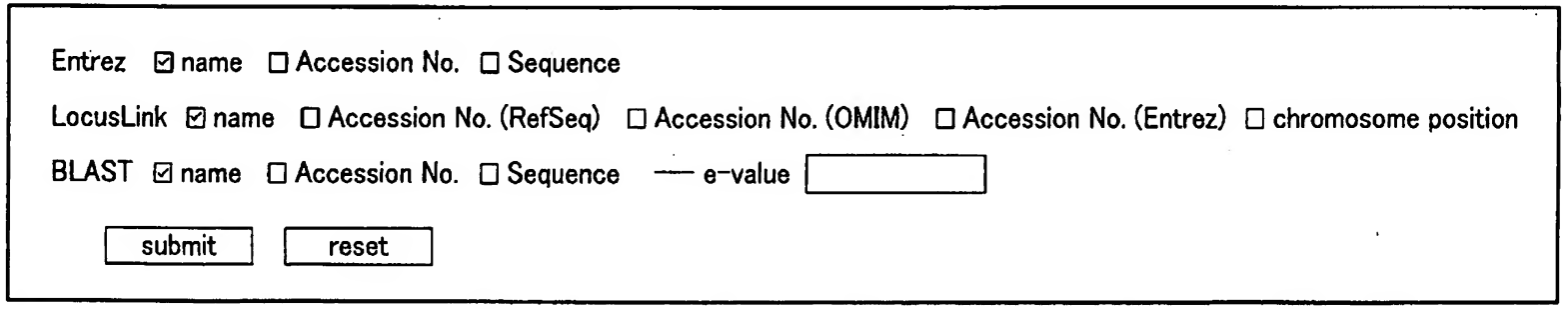


FIG. 18

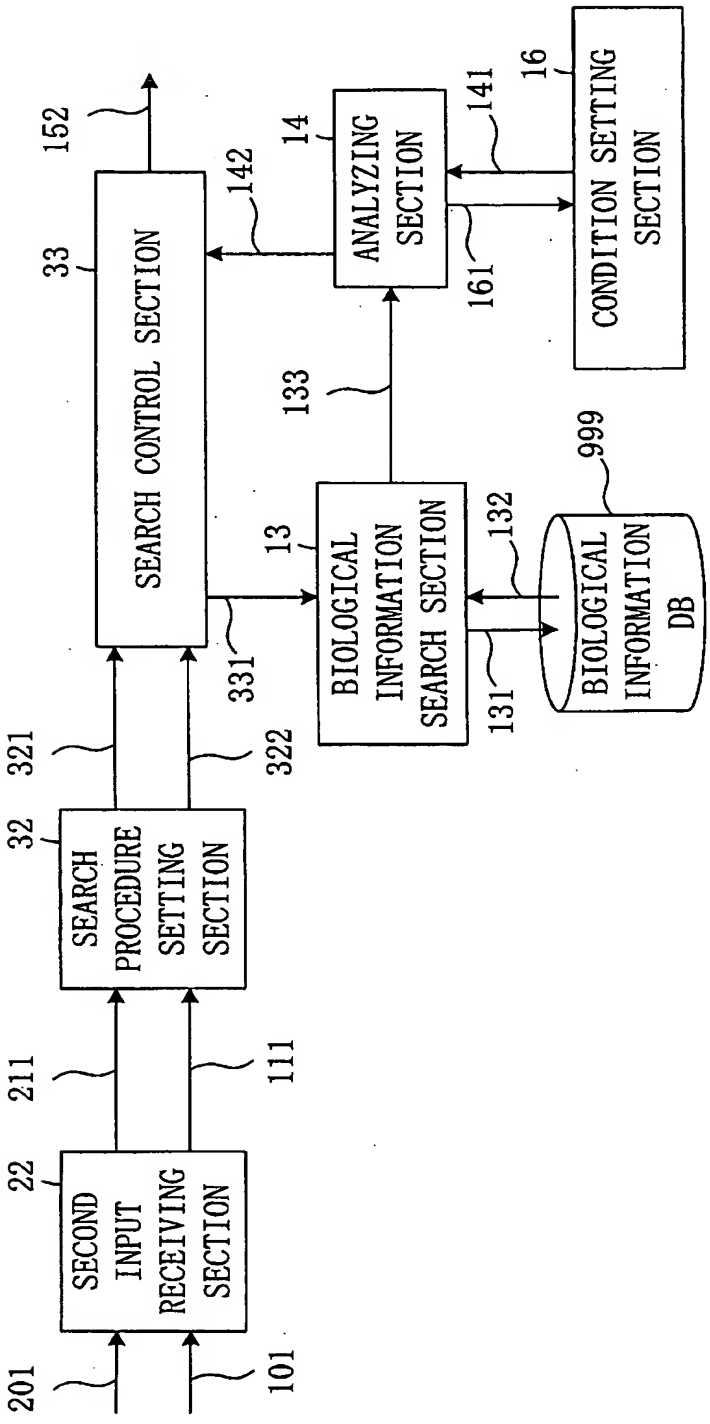

201
101
22
SECOND INPUT RECEIVING SECTION
211
111
32
SEARCH PROCEDURE SETTING SECTION
321
322
33
SEARCH CONTROL SECTION
152
331
13
BIOLOGICAL INFORMATION SEARCH SECTION
131
132
999
BIOLOGICAL INFORMATION DB
133
14
ANALYZING SECTION
142
161
141
16
CONDITION SETTING SECTION

FIG. 19

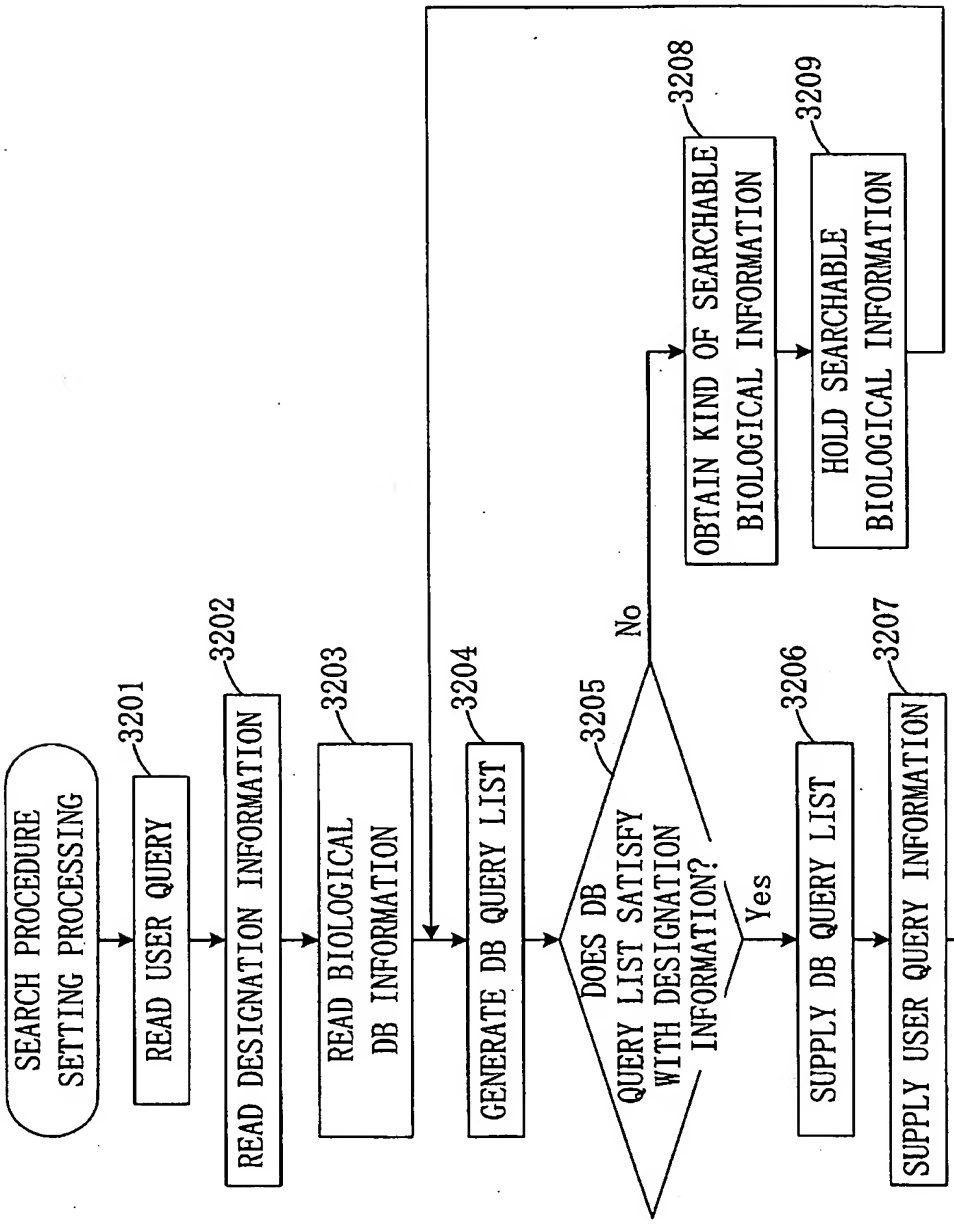

SEARCH PROCEDURE SETTING PROCESSING
3201
READ USER QUERY
3202
READ DESIGNATION INFORMATION
3203
READ BIOLOGICAL DB INFORMATION
3204
GENERATE DB QUERY LIST
3205
DOES DB QUERY LIST SATISFY WITH DESIGNATION INFORMATION?
No
Yes
3208
OBTAIN KIND OF SEARCHABLE BIOLOGICAL INFORMATION
3209
HOLD SEARCHABLE BIOLOGICAL INFORMATION
3206
SUPPLY DB QUERY LIST
3207
SUPPLY USER QUERY INFORMATION
END

FIG. 20

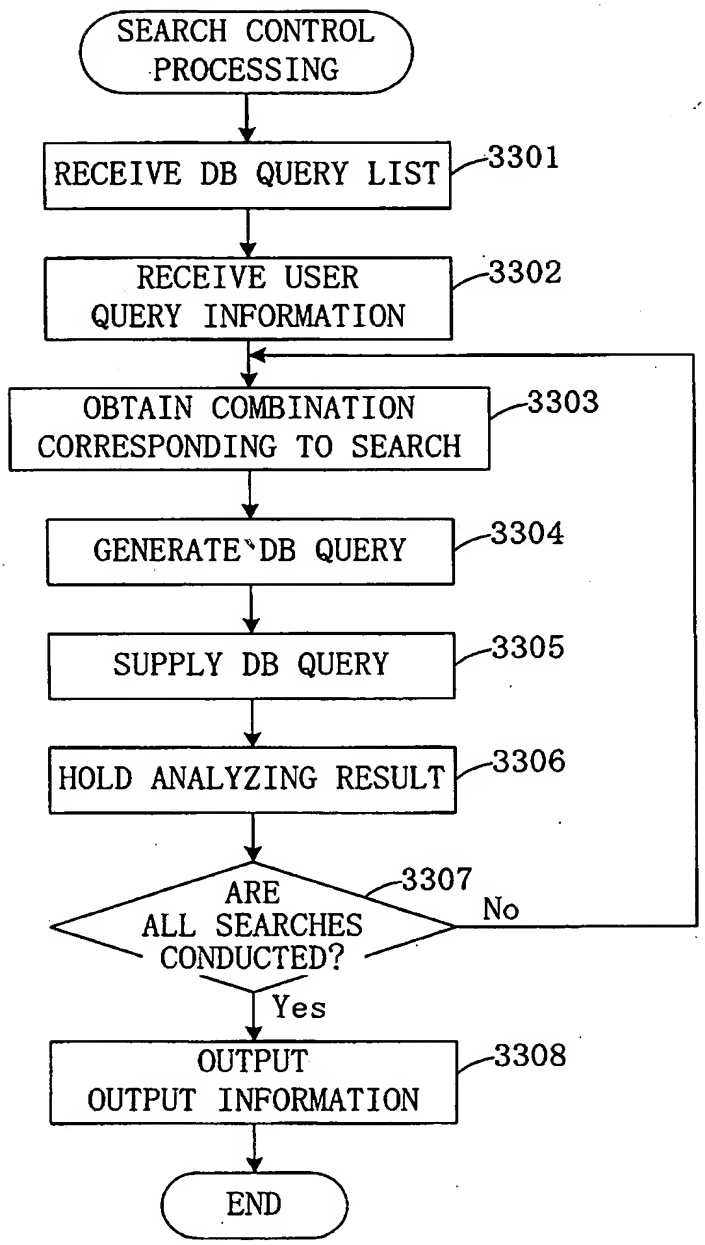

SEARCH CONTROL PROCESSING
RECEIVE DB QUERY LIST
3301
RECEIVE USER QUERY INFORMATION
3302
OBTAIN COMBINATION CORRESPONDING TO SEARCH
3303
GENERATE DB QUERY
3304
SUPPLY DB QUERY
3305
HOLD ANALYZING RESULT
3306
ARE ALL SEARCHES CONDUCTED?
3307
No
Yes
OUTPUT OUTPUT INFORMATION
3308
END

FIG. 21

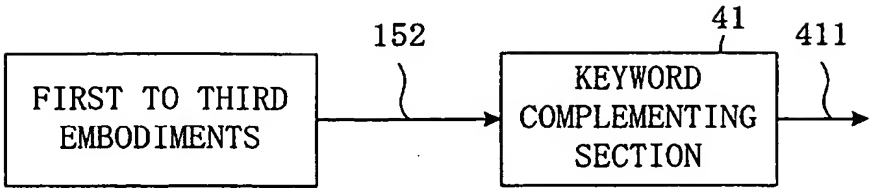

FIRST TO THIRD EMBODIMENTS
152
41
KEYWORD COMPLEMENTING SECTION
411

FIG. 22

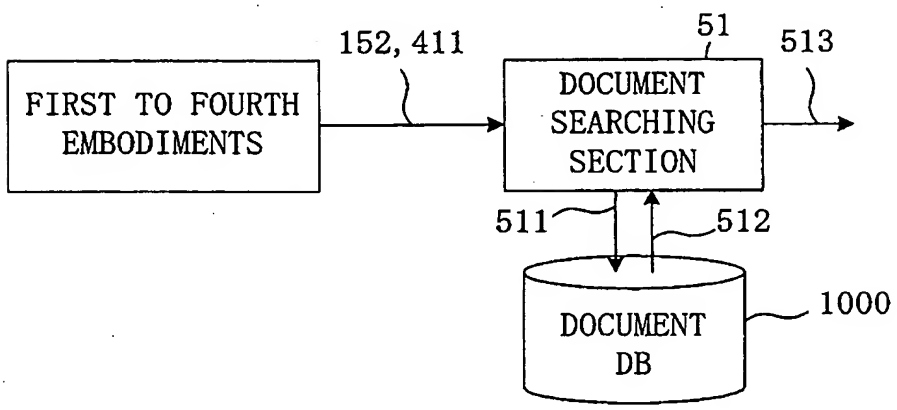

FIRST TO FOURTH EMBODIMENTS
152, 411
51
DOCUMENT SEARCHING SECTION
513
511
512
DOCUMENT DB
1000

FIG. 23

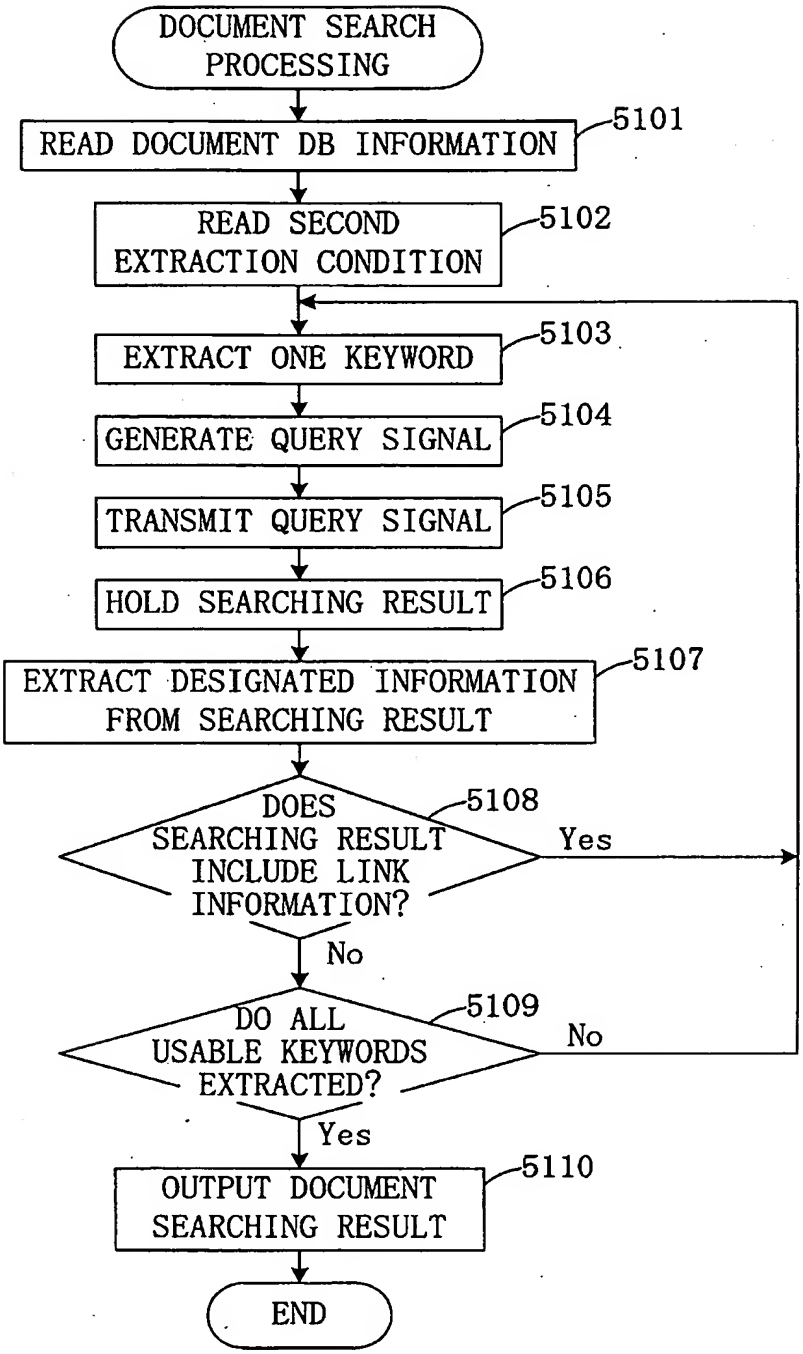
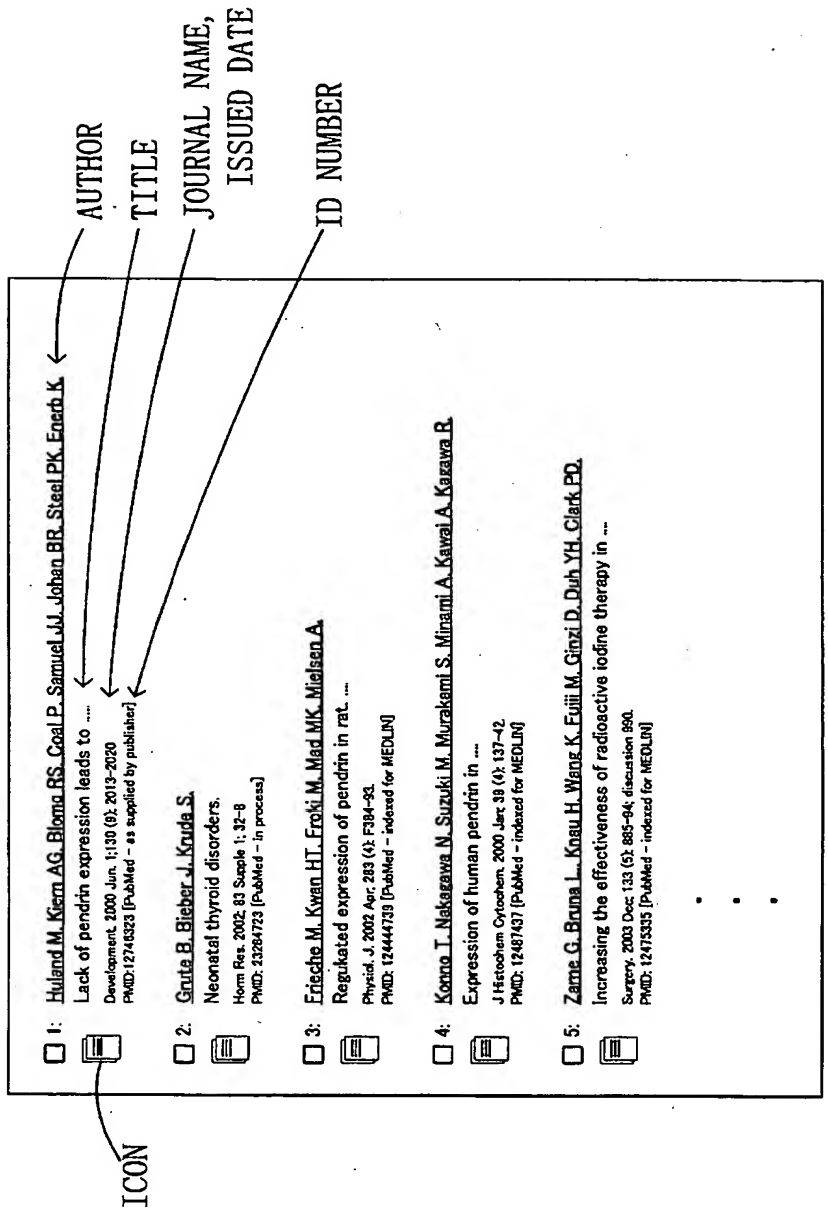

DOCUMENT SEARCH PROCESSING
READ DOCUMENT DB INFORMATION
5101
READ SECOND EXTRACTION CONDITION
5102
EXTRACT ONE KEYWORD
5103
GENERATE QUERY SIGNAL
5104
TRANSMIT QUERY SIGNAL
5105
HOLD SEARCHING RESULT
5106
EXTRACT DESIGNATED INFORMATION FROM SEARCHING RESULT
5107
DOES SEARCHING RESULT INCLUDE LINK INFORMATION?
5108
Yes
No
DO ALL USABLE KEYWORDS EXTRACTED?
5109
No
Yes
OUTPUT DOCUMENT SEARCHING RESULT
5110
END

FIG. 24


AUTHOR
TITLE
JOURNAL NAME,
ISSUED DATE
ID NUMBER
ICON
1: Huland M, Kiern AG, Bloma RS, Coal P, Samuel JJ, Johan BR, Steel PK, Enerb K
Lack of pendrin expression leads to ....
Development. 2000 Jun; 1;130 (9): 2013-2020
PMID:12745323 [PubMed - as supplied by publisher]
2: Grute B, Bieber J, Kruda S.
Neonatal thyroid disorders.
Horm Res. 2002; 83 Supple 1; 32-8
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PMID: 12475335 [PubMed - indexed for MEDLIN]

FIG. 25

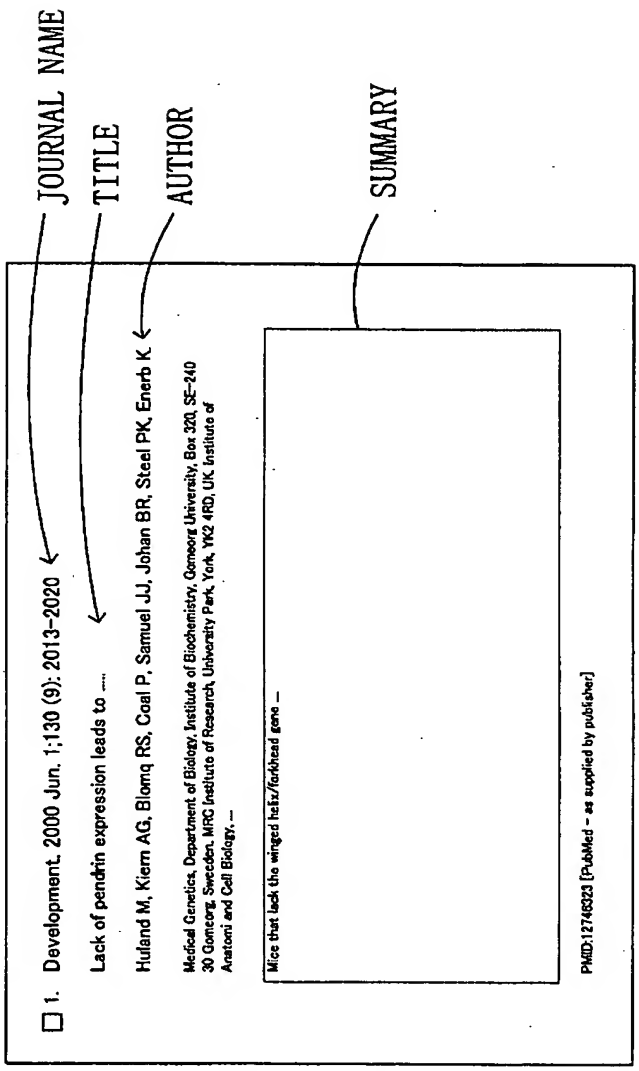

JOURNAL NAME
TITLE
AUTHOR
SUMMARY
1. Development. 2000 Jun. 1;130 (9): 2013-2020
Lack of pendrin expression leads to ....
Huland M, Kiern AG, Blomq RS, Coal P, Samuel JJ, Johan BR, Steel PK, Enerb K
Medical Genetics, Department of Biology, Institute of Biochemistry, Gomoorg University, Box 320, SE-240
30 Gomberg, Sweeden, MRC Institute of Research, University Park, York, YK2 4RD, UK, Institute of
Anatomi and Cell Biology. --
Mice that lack the winged helix/forkhead gene --
PMID:12746023 [PubMed - as supplied by publisher]

FIG. 26

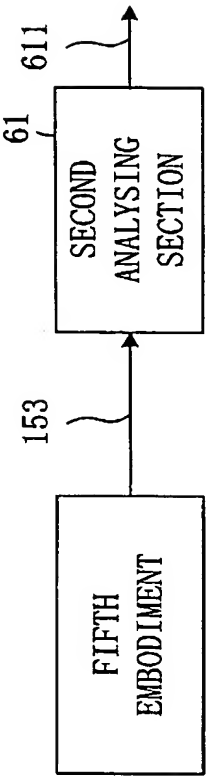
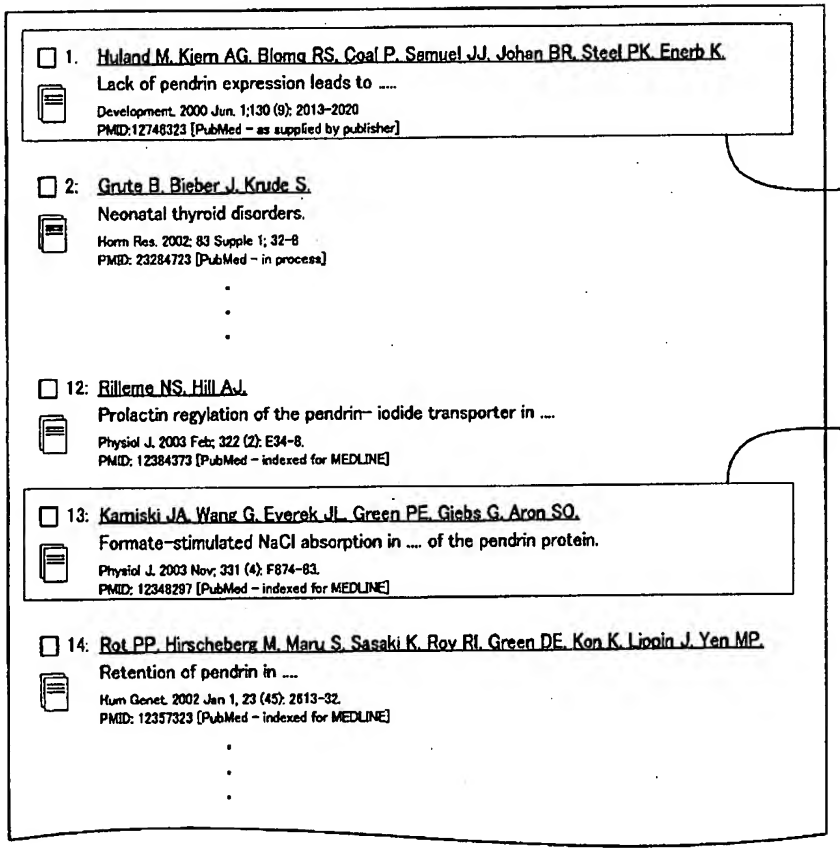


FIG. 27



EXAMPLE OF SCHOLARLY PAPER OBTAINED BY ONLY SEARCHING RESULT DUE TO PENDRIN

EXAMPLE OF SCHOLARLY PAPER OBTAINED BY BOTH SEARCHING RESULT DUE TO PENDRIN AND SEARCHING RESULT DUE TO SLC26A4

FIG. 28

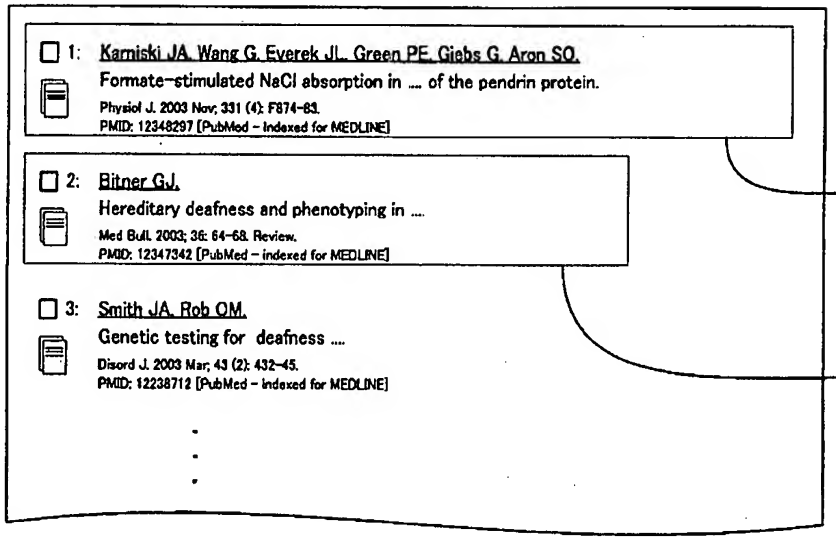


FIG. 29

Title: SYSTEM AND METHOD FOR SEARCHING INFORMATION
Inventor(s): Takeru NAKAZATO, et al.
DOCKET NO.: 089367-0126

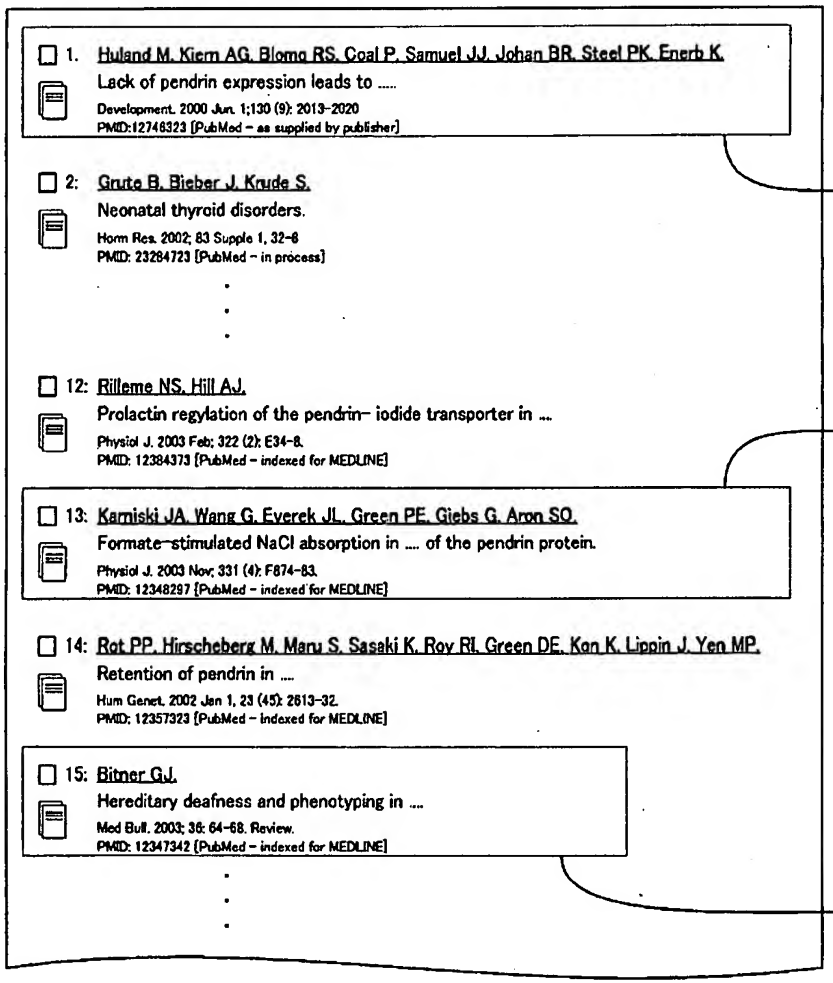


FIG. 30

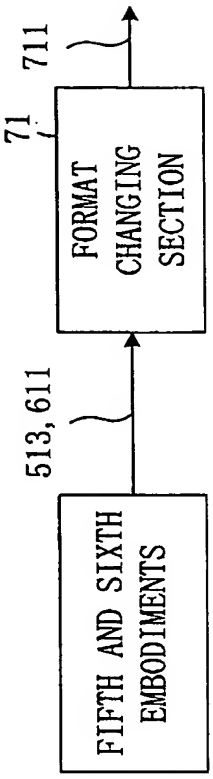

FIFTH AND SIXTH EMBODIMENTS
513, 611
71
FORMAT CHANGING SECTION
711

FIG. 31

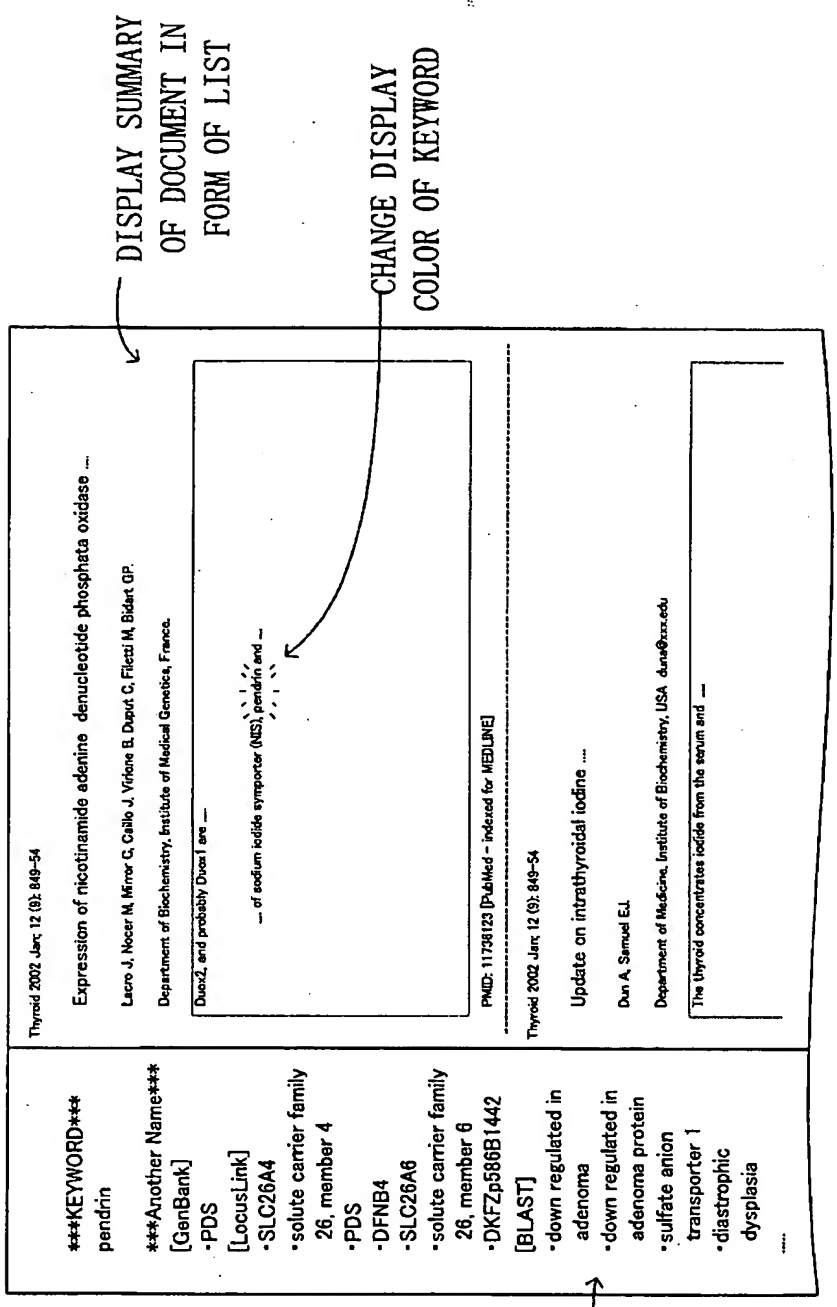

DISPLAY SUMMARY OF DOCUMENT IN FORM OF LIST
CHANGE DISPLAY COLOR OF KEYWORD
DISPLAY GENE OR PROTEIN BYNAME
KEYWORD
pendrin
Another Name
[GenBank]
·PDS
[LocusLink]
·SLC26A4
·solute carrier family 26, member 4
·PDS
·DFNB4
·SLC26A6
·solute carrier family 26, member 6
·DKFZp586B1442
[BLAST]
·down regulated in adenoma
·down regulated in adenoma protein
·sulfate anion transporter 1
·diastrophic dysplasia
....
Thyroid 2002 Jan; 12 (9): 849-54
Expression of nicotinamide adenine denucleotide phosphate oxidase ....
Lacro J, Nocer M, Mirror C, Calilo J, Virlone B, Dupuit C, Filetti M, Bidart GP.
Department of Biochemistry, Institute of Medical Genetics, France.
Duox2, and probably Duox1 are —
— of sodium iodide symporter (NIS), pendrin and —
PMID: 11738123 [PubMed - indexed for MEDLINE]
Thyroid 2002 Jan; 12 (9): 849-54
Update on intrathyroidal iodine ....
Dun A, Samuel EJ.
Department of Medicine, Institute of Biochemistry, USA dunx@xxx.edu
The thyroid concentrates iodide from the serum and —

FIG. 32